IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Kumar et al.

Attorney Docket No.: ANDIP007/8999

Application No.: 10/045,883

Examiner: Serrao, Ranodhi N.

Filed: January 9, 2002

Group: 2141

Title: METHODS AND APPARATUS FOR IMPLEMENTING VIRTUALIZATION OF STORAGE WITHIN A STORAGE AREA NETWORK THROUGH A VIRTUAL ENCLOSURE

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Services as First Class Mail to: Commissioner of Patents and Trademarks, P.O. Box 1450, Alexandria, VA 22313-1450 on September 28, 2006.

Signed _____

Mary Deauclaire

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Applicant requests review of the final rejection in the above-identified application.

This request is being filed with a Notice of Appeal.

The review is requested for the reasons stated on the attached sheets.

Remarks begin on page 2 of this paper.

REMARKS

REJECTION OF CLAIM 21 UNDER 35 USC §102

In the Office Action, the Examiner has rejected claim 21 under 35 USC §102(e) as being anticipated by Terrell et al, U.S. Pub. No. US 2003/0210686 A1, ('Terrell' hereinafter). This rejection is fully traversed below.

Claim 21 recites, in part, "sending a virtualization message to a physical port of a second network device within the storage area network, the virtualization message instructing the physical port to handle messages addressed to a virtual port of a virtual enclosure, the virtual enclosure having one or more virtual ports and being adapted for representing one or more virtual storage units, each of the virtual storage units representing one or more physical storage locations on one or more physical storage units of the storage area network, wherein the virtualization message indicates that the physical port is to handle messages addressed to an address or identifier assigned to the virtual port." (Underline added). In this manner, a physical port of a network device is instructed to handle messages addressed to a virtual port of a virtual enclosure.

Terrell discloses a router and methods using network addresses for virtualization. See title. If a routing processor detects the frame's destination is a virtual entity, and so is a part of a virtual transaction, the router conducts a nonvirtual transaction in concert with the virtual transaction. The nonvirtual transaction accomplishes the intent of the virtual transaction but operates on an actual network port, for example, a storage device. See Abstract. More particularly, the first routing processor parses a frame received from its input port to determine a virtual destination identifier, determines a nonvirtual transaction identifier in response to the virtual destination identifier, prepares a second frame having the nonvirtual transaction identifier, and transmits the second frame to the fabric. The second routing processor receives the transmitted second frame from the fabric and transmits the second frame to its output port. The second processor, on receiving a third frame on its input port parses the third frame to determine a nonvirtual transaction identifier, marks the third frame for modification, and transmits the third frame to the fabric. The first processor receives the transmitted third frame from the fabric, parses the third frame to access the routing

information from its memory, modifies the third frame in accordance with the accessed routing information, and transmits the modified frame from its output port. See [0025].

It is important to note that the modified frame that is transmitted in Terrell includes the nonvirtual transaction identifier. In other words, the virtual destination identifier is entirely replaced with the nonvirtual transaction identifier. Stated another way, "[o]n receiving from a requester a data frame directed to a virtual participant, the frame processor modifies the data frame in the ingress buffer for routing to a nonvirtual participant." See [0024]. Thus, the nonvirtual participant receiving the frame for processing is not instructed to handle messages addressed to a virtual port. Rather, it merely appears to the nonvirtual participant that it is receiving a frame that is addressed to it. Moreover, Terrell fails to disclose sending a message to a physical port indicating that the physical port is to handle messages addressed to an address or identifier assigned to a virtual port. In fact, the nonvirtual participant in Terrell receives a frame that no longer contains the virtual destination identifier and the nonvirtual participant is unaware that it is handling a frame that was previously addressed to a virtual entity. Accordingly, Terrell fails to disclose or suggest "sending a virtualization message to a physical port of a second network device within the storage area network, the virtualization message instructing the physical port to handle messages addressed to a virtual port of a virtual enclosure, the virtual enclosure having one or more virtual ports and being adapted for representing one or more virtual storage units, each of the virtual storage units representing one or more physical storage locations on one or more physical storage units of the storage area network, wherein the virtualization message indicates that the physical port is to handle messages addressed to an address or identifier assigned to the virtual port." Applicant therefore respectfully asserts that Terrell fails to anticipate the invention of claim 21.

The Examiner points to paragraph 123 of Terrell, which states that "[a] proxy process includes any process that receives frames in a first transaction and that prepares frames directed to a nonvirtual member or resource in a second transaction." The Examiner further asserts that a physical port of a router handles the message, citing paragraph 228. However, paragraphs 123 and 228 fail to disclose or suggest sending a virtualization message to a physical port indicating that the physical port is to handle messages addressed to an address or identifier assigned to the virtual port, as claimed. The Examiner further asserts that a message directed towards a nonvirtual member is the same as a message being sent to a

physical port. Applicant respectfully traverses this assertion. Moreover, as set forth above, the "nonvirtual member" of Terrell is not instructed to handle messages addressed to an address or identifier assigned to a virtual port, nor does the "nonvirtual member" of Terrell receive a virtualization message instructing the physical port to handle messages addressed to a virtual port of a virtual enclosure. In view of the above, Applicant respectfully asserts that claim 21 is patentable over the cited art.

REJECTION OF CLAIMS UNDER 35 USC §103

In the Office Action, the Examiner has rejected claims 1, 3-29, and 31-52 under 35 USC §103(a) as being unpatentable over Blumenau, U.S. Patent No. 6,260,120, ('Blumenau' hereinafter) and Terrell. This rejection is fully traversed below.

The Examiner admits that Blumenau fails to teach wherein associating each of the virtual enclosure ports of the virtual enclosure with a port of a network device within the storage area network includes: sending a message from a first network device to a physical port of a second network device within the storage area network to instruct the physical port of the second network device to handle messages addressed to the address or identifier assigned to the associated virtual port, thereby enabling the first network device to instruct the physical port of the second network device to act on behalf of the virtual port. The Examiner seeks to cure the deficiencies of Blumenau with Terrell.

As set forth above, Terrell fails to cure the deficiencies of Blumenau. The Examiner cites paragraph 158 of Terrell. Paragraph 158 recites "[w]hen a transaction is begun involving one or more virtual devices (herein called a virtual transaction) routing process 208 identifies a frame that signals the beginning of the virtual transaction, and in response to that frame and in accordance with the protocol identified to the virtual transaction performs the remainder of the virtual transaction in concert with beginning and performing a corresponding transaction with a physical member and/or device (herein called a nonvirtual transaction)." Thus, the routing process performs nonvirtual transaction(s) corresponding to a virtual transaction. This is accomplished by performing a corresponding transaction with a physical member and/or device for each nonvirtual transaction. However, each physical member/device is not instructed to handle messages addressed to a virtual port or act on behalf of the virtual port. Rather, the physical member/device receives a frame addressed to the physical member/device. In other words, the physical member/device is merely

performing a transaction by handling a frame addressed to it. The frame is not addressed to a virtual port. The mapping to the physical member/device has already been performed via the routing process.

The Examiner further cites paragraph 237 of Terrell. Paragraph 237 of Terrell indicates that data in storage may be organized in a ring buffer for each output queue. In one implementation, frames are enqueued in accordance with the physical port that received the frame, the physical port identifier to which the frame is destined to be sent, and one or more policy values. Thus, frames addressed to the physical port identifier are enqueued appropriately. The frames do not identify a virtual port. In no manner is the physical port receiving a frame addressed to it instructed to handle frames addressed to a virtual port. Rather, the physical port is unaware that the frame was previously addressed to a virtual port. Accordingly, Applicant respectfully submits that Terrell fails to cure the deficiencies of Blumenau.

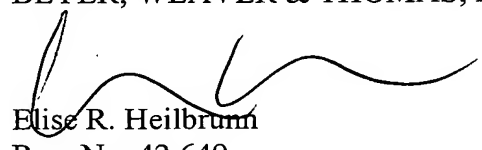
The Examiner asserts that the features upon which Applicant relies (i.e., the instruction of a physical port to function on behalf of a virtual port in a dynamic manner) are not recited in the rejected claims. Applicant respectfully traverses this assertion. As recited in the pending claims, a separate network device (e.g., virtual enclosure server) operates to instruct a physical port of another network device to act on behalf of a virtual port (e.g., by sending a virtualization message to the physical port of the network device). Thus, this separate network device sends a message to the physical port. In other words, by sending such a message to a physical port, the physical port may be instructed in a dynamic manner (e.g., rather than being hard-coded or statically configured). In accordance with the pending claims, since a virtual port may be "implemented" by a physical port of any network device within the storage area network, a network's virtualization capacity may scale with the number of ports in the network. Moreover, sending a message to a port of a network device within the storage area network enables virtualization within a storage area network to be dynamically established (e.g., rather than hard-coded).The cited references, separately or in combination, fail to support the implementation of virtualization among any number of network devices within a storage area network, as claimed. Moreover, the cited references, separately or in combination, fail to support the dynamic implementation of virtualization of storage within a storage area network through the use of a virtualization message, as claimed. In fact, as set forth in col. 24, lines 25-33 of Blumenau, the "port adapter providing the physical port is programmed to function as an FL_Port, E_Port or F_Port..." In other words,

the instruction of a physical port to function on behalf of a virtual port as set forth in Blumenau is not dynamic. Rather, the physical port is merely programmed to operate in this manner. As such, Blumenau teaches away from the dynamic implementation of virtualization of storage within a storage area network through the use of a virtualization message. Moreover, the combination of the cited references would fail to operate as claimed, and therefore would fail to achieve the desired result. Accordingly, Applicant respectfully submits that the independent claims are patentable over the cited references.

The dependent claims depend from one of the independent claims and are therefore patentable for at least the same reasons. However, the dependent claims recite additional limitations that further distinguish them from the cited references. For instance, claim 14 recites "assigning one or more virtual storage units to the virtual enclosure." While Blumenau requires that a host be associated with one or more virtual ports (for volume partitioning), the claimed invention creates a virtual enclosure that may access the virtual storage units. As such, combining the cited references would fail to operate in the claimed manner. Accordingly, Applicant respectfully submits that claim 14 is patentable over the cited art.

The additional limitations recited in the independent claims or the dependent claims are not further discussed, as the above discussed limitations are clearly sufficient to distinguish the claimed invention from the cited reference. Thus, it is respectfully requested that the Examiner withdraw the rejection of the claims under 35 USC §103.

Respectfully submitted,
BEYER, WEAVER & THOMAS, LLP



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